China Journal of Accounting Research 7 (2014) 81–100

Contents lists available at ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Board affiliation and pay gap

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ARTICLE INFO

Article history:
Received 25 April 2013
Accepted 8 March 2014
Available online 26 April 2014

JEL classification:
G34
J33
M12

Keywords:
Board affiliation
Pay gap
Agency problem

ABSTRACT

This paper examines the effects of board affiliation on the corporate pay gap. Using a sample of Chinese listed firms from 2005 to 2011, we find that boards with a greater presence of directors appointed by block shareholders have lower pay gaps. Furthermore, the governance effects of board affiliation with and without pay are distinguished. The empirical results show that board affiliation without pay is negatively related to the pay gap, while board affiliation with pay is positively related to the pay gap. Overall, the results shed light on how block shareholders affect their companies' pay gaps through board affiliation.

1. Introduction

Compensation packages are an important part of a modern company's incentive system. Most relevant research has focused on examining the level of executive pay and the different components of executive compensation, while ignoring further discussion about a company's pay gap. Originally, the pay-gap phenomenon could be chiefly explained by tournament theory. That is, an appropriate pay gap increases employee motivation and productivity. However, in recent years, company pay gaps have continuously widened, which appears to be due to company executives manipulating the formulation process of compensation to increase

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http://dx.doi.org/10.1016/j.cjar.2014.03.001

their salaries beyond the optimal level (Bebchuk and Fried, 2003). According to the executive-power theory, executive misuse of their power to obtain excessive pay has a series of negative economic consequences, such as the failure of salary–incentive mechanisms and a decline in overall company performance (Bebchuk et al., 2011).

Within the ongoing development of the Chinese economy, the compensation received by executives in Chinese companies is increasing rapidly and company pay gaps are widening. For example, the 2010 annual report of China International Marine Containers (Group) Ltd. (stock code 000039) indicates that the company's largest compensation package of that year was 6.0 million RMB yuan, while its average annual employee wage was only 65,800 yuan. In 2011, the highest executive compensation reached 9.6 million yuan, while the average annual employee wage was only 78,600 yuan. The company's pay gap thus increased between 2010 and 2011, from a highest 90 times of the average employee pay, to a highest 121 times of the average employee pay. When considering the possible negative effect of the pay gap, it is necessary to determine whether the company's governance mechanisms are able to effectively reduce its pay gap and ease the agency problem during the process of formulating compensation packages.

In China's specific institutional setting, block shareholders are entitled to appoint personnel to listed companies as directors. This is one of the major ways for block shareholders to supervise company executives. Once the block shareholders of a company have realized that an agency problem is affecting the salary-setting process, they appoint certain personnel as company directors responsible for supervising executives' opportunistic behavior. However, the governance effect of board affiliation may differ substantially due to differences in receiving compensation. Currently, the directors appointed by block shareholders may either receive or not receive pay from the listed companies for which they work. Salaried directors appointed by block shareholders are more reliant than their non-salaried counterparts on the executives of the listed company, which may reduce director independence and thus impair the efficiency of their executive supervision. In contrast, non-salaried directors appointed by the block shareholders are more independent, better able to represent the interests of block shareholders to supervise executives, and ultimately achieve a better supervision effect. As a result, only non-salaried directors appointed by block shareholders can help significantly to ease the agency problem and reduce a company's pay gap.

Using a sample of Chinese A-share listed firms from the 2005–2011 period, we examine the effects of the company-governance mechanism of board affiliation on the pay gap. Following other studies on this topic, we interpret the pay gap between executives and employees, and the pay gap among executives as proxies for the pay gap (Bu and Peng, 2010; Banker et al., 2011; Kato and Long, 2011). We measure board affiliation using the ratio of the number of directors appointed by block shareholders to the total number of directors on the board (Yeh and Woidtke, 2005; Chen et al., 2013). We also examine the different roles of salaried and non-salaried directors appointed by block shareholders. We measure the proportion of salaried directors as the ratio of the number of salaried directors appointed by block shareholders to the total number of directors on the board. We measure the proportion of non-salaried directors as the ratio of the number of non-salaried directors appointed by block shareholders to the total number of directors on the board.

Consistent with our prediction, we find that board affiliation is negatively related to the pay gap. Furthermore, the results show that a greater presence of salaried directors appointed by block shareholders is associated with a higher pay gap, whereas a greater presence of non-salaried directors appointed by block shareholders is associated with a lower pay gap. These findings still hold when tested with a two-stage regression model, so endogeneity issues are less likely to bias our empirical findings.

Next, we investigate certain factors that may affect the relationship between board affiliation and the pay gap. We begin by examining whether differences in product market competition affect how board affiliation reduces the pay gap. If a firm uses its pay gap as an incentive mechanism and the product market is highly competitive, the salaried directors appointed by the firm's block shareholders will increase the pay gap to stimulate executives to work hard. However, under the same conditions, non-salaried directors appointed by block shareholders will decrease rather than increase the pay gap. We find that the governance effect of board affiliation on the pay gap is particularly prominent in industries in more competitive product markets.

Second, we investigate whether differences in ownership affect the extent that board affiliation reduces the pay gap. The results indicate no significant differences in the effects of salaried and non-salaried directors appointed by block shareholders on the pay gap between state-owned and non-state-owned enterprises. This

implies that pay-gap issues resulting from the agency problem receive considerable attention from block shareholders in both state-owned firms and non-state-owned firms.

Third, as controlling and non-controlling shareholders may have different motivations for appointing directors, we separately examine the effects on the pay gap of directors appointed by controlling shareholders and those appointed by non-controlling shareholders. We find no significant difference in the governance function of board affiliation between controlling shareholders and non-controlling shareholders.

Finally, we determine whether different administrative duties affect the extent to which board affiliation reduces the pay gap. We distinguish between the administrative duties of the highest-paid executives and investigate the relationship between board affiliation and the pay gap in each case. The results suggest that differences in administrative duties do not affect the governance function of board affiliation.

This paper contributes to the literatures in the following ways. First, it offers supportive evidence on company pay gaps. For example, Bebchuk et al. (2011) find that executive pay gaps are associated with lower firm value and lower future cash flows. Our results suggest that the presence of non-salaried directors appointed by block shareholders decreases the pay gap. Second, our study provides implications for research on board affiliation. For a sample of Japanese companies, Colpan and Yoshikawa (2012) investigate the governance effect of directors appointed by block shareholders on the agency problem. Our paper adds to the literature by using a sample of Chinese listed firms and explores the different roles of salaried and non-salaried directors appointed by block shareholders.

The rest of the paper proceeds as follows. In Section 2, we review the relevant literature. In Section 3, we develop hypotheses based on an analysis of the institutional background. In Section 4, we describe our sample, variables and research design. In Section 5, we present our empirical results and analysis. Section 6 concludes the paper.

2. Literature review

Recently, the rapid growth in executive compensation has caused company pay gaps to bigger. Bebchuk and Grinstein (2005) examine the changes in executive compensation in U.S. listed companies from 1993 to 2003, and find that the growth in executive compensation during this period was much higher than company growth in terms of size and performance, with the growth in CEO compensation exceeding the total growth in the compensation of executives at the second, third, fourth and fifth levels. Specifically, the proportion of CEO compensation in the total compensation received by top-five executives increased from 39% in 1993 to 43% in 2003. Li (2011) examines 1993–2006 data on executive compensation in U.S. capital-market listed companies and finds that the difference between CEO compensation and No. 2 executive compensation increased from 40% in 1993 to 60% in 2006. Using a sample of Canadian listed companies during 2000–2005, Sapp (2008) reports that within this six-year period, the pay gap between CEOs and other executives doubled. Investigating Chinese listed companies in 1999 to 2000, Lin et al. (2003) report that the compensation received by CEOs was 1.43 times greater than the compensation provided to other executives. The pay gap has also expanded after 2001, with CEO compensation 2.328 times that of other executives' compensation in 2009.

In addition to the widening pay gap among executives, the pay gap between executives and employees is also expanding. Hall and Murph (2003), using S&P500 firms as their sample, report that executive compensation increased from 30 times that of other employees in 1970 to 1990 times in 2002. Studies on Chinese listed companies describe a similar phenomenon. The proportion of companies with the pay gap within five times is declining, while the companies with the pay gap more than eight times increased from 10% to 24.53% (Zhang, 2008). In a recent study, Liu and Sun (2010) find that the absolute pay gap between executives and employees in state-owned enterprises reached 290,000 yuan in 2007, which is almost double the pay gap in 2004. Thus, the expansion of company pay gaps now seems to be a common worldwide phenomenon.

"Tournament theory" has been used to explain the effects of the pay gap. This theory explains that increasing the pay gap can help enhance executives' enthusiasm for work, reduce supervising costs and ultimately improve corporate performance. When a company designs a compensation package based on tournament theory, the level of executive compensation depends on relative performance rather than absolute performance. As a result, the pay gap gradually increases as promotions occur (Lazear and Rosen, 1981; Rosen, 1986). This kind salary structure can have a positive and incentivizing effect on executives, prompting them to exert more

effort to compete for better positions. However, as economic activities have become more complex and supervising executives has become a more difficult and costly process, companies' need for an internal pay gap has increased. An appropriate pay gap can help to reduce opportunistic behavior among competitive executives, therefore reduce supervising costs. Research in this area has also addressed the necessity of a company pay gap from the perspective of internal CEO candidate structure and CEO succession risk (Schwarz and Severinov, 2010). With these criteria in mind, an internal pay gap is one of the most important means for a company to motivate employees and attract the talents, making it a form of valuable expenditure that shareholders are willing to accept. It can thus have a positive effect on company performance.

However, the phenomenon of the continuously widening pay gap has in recent years led people to reflect and sometimes cast doubt on the positive, incentivizing effect of tournament theory. "Executive-power theory" explains that widening pay gaps lead to excessive pay gaps as a result of executive misuse of their power to increase their own level of pay and obtain private benefits (Bebchuk and Fried, 2003). Fundamental to this theory is the assumption that company executives, especially CEOs, are eager to pursue and secure greater power. With a sufficient level of power, they can control the board of directors and thereby influence the design of their companies' compensation contracts to increase their own compensation without the constraints and limitations imposed by shareholders and regulators. This leads to the expansion of the company pay gap (Adams et al., 2005). According to executive-power theory, therefore, excessive pay gaps are likely to result from the misuse of executive power to influence the design of compensation contracts.

The findings of recent empirical studies support the executive-power theory. Bebchuk et al. (2011) analyze 12,011 U.S. companies from the 1993–2004 period and report that the larger the pay gaps between the top-five executives, the lower the value of the company. Chen et al. (2011b) examine U.S. listed companies between 1993 and 2007, and argue that a large pay gap between executives signifies to those external to the company that the company has a serious agency problem. This leads to a significant increase in the company's cost of capital. The authors also observe that the agency problem is more serious in companies with greater cash flows and those that have experienced changes in executive structure. In other words, the positive relationship between the pay gap and agency problems is much stronger under these conditions.

3. Institutional background and research hypothesis

3.1. Institutional background

Until the end of 1992, although the Chinese government encouraged enterprises to widen their pay gaps to some extent when designing employee-compensation plans, a clear restriction was still in place: executive compensation was not permitted to exceed three times that of the average employee. However, egalitarian compensation designs tend to reduce employee enthusiasm, thus impairing overall company productivity. To accelerate the development of China's market economy, the government advocated from 1993 to 2003 that companies "give priority to efficiency with due consideration to fairness." Relevant laws and regulations were introduced to facilitate the expansion of pay gaps "among all kinds of personnel" to increase employee enthusiasm and maximize social wealth. Encouraged by the government, companies' internal pay gaps expanded rapidly. The data disclosed by the SASAC (the State-owned Assets Supervision and Administration Commission) show that executive compensation in China's central government controlled enterprises was 12 times than average employee salary in 2002, reached 13.6 times in 2003, and continues to expand.

The negative effects of these excessive pay gaps aroused great concerns from China's government, which accordingly made several adjustments to its policy during major conferences. In 2009, during the first session of the 11th National People's Congress, the government expressed the intention to "progressively reverse" the widening trend of the pay gap. In 2012, during the second session of the 11th National People's Congress, it promised to "speedily reverse" the trend. Analysis of the rhetoric of the Congress suggests that the government became less tolerant of the excessive pay gap and thus increased its efforts to reduce the excessive pay gap. From expressing "encouragement" of the widening gap, it proposed "gradually reversing" this trend, and eventually described a "resolute" and "speedy" reversal. This indicates that the negative effects of an excessive pay gap on the development of China's economy now urgently require a solution from the Chinese government.

3.2. Research hypothesis

Once the block shareholders in a company realize that the company's excessive pay gap is due to the agency cost of executive power, they are likely to introduce governance mechanisms to mitigate these agency problems. Fama and Jensen (1983) point out that a company's board of directors plays an important role in supervising executives and reducing the agency costs. It is common for block shareholders to directly appoint personnel to a company's board of directors in a supervisory capacity, in order to ensure that executives efficiently represent the interests of the company's shareholders (Yeh and Woidtke, 2005). The contribution of a shareholder-appointed director significantly improves company governance. For example, Colpan and Yoshikawa (2012) examine Japanese listed companies and find that directors appointed by block shareholders can reduce companies' agency problems by enhancing the sensitivity of the relationship between compensation and performance. In supervising executives, the directors represent shareholders' interests and deploy effective governance mechanisms to control the pay gap caused by the misuse of executive power, thereby reducing the opportunistic behavior of executives in pursuit of excessive compensation, and ultimately reducing the company's overall pay gap. We thus propose the following hypothesis.

Hypothesis 1. The ratio of directors appointed by shareholders to the total number of directors is negatively related to the company pay gap.

Generally, company directors have two main functions: supervising other employees and providing strategic recommendations (Brickley and Zimmerman, 2010). However, high performance in one area may compromise the success of the other. Masulis et al. (2012) report that based on their sample, foreign independent directors hired by U.S. listed companies successfully provide strategic advice, such as helping executives to implement cross-border mergers and acquisitions strategies, and achieve high returns. However, the authors also observe that such directors fail to fulfill their supervisory role. They are frequently absent from board meetings and CEO compensation tends to be too high. Moreover, when company performance is poor, foreign independent directors often fail to dismiss incompetent CEOs in a timely fashion. Investigating directors' supervisory role, Faleye et al. (2011) report that in companies with stronger director supervision, there is a greater correlation between change in CEO and performance. In addition, the CEOs of these companies receive less excessive compensation and perform less earnings management. However, the strategic performance of the directors of these companies is comparatively weak.

Two kinds of directors may be appointed by block shareholders to China's listed companies: salaried and non-salaried directors. Salaried directors appointed by block shareholders often provide executives with strategic management advice and either participate in or are responsible for company management. Such directors are independent, but are also more susceptible to the influence of other executives, making it difficult for them to effectively perform the duties required of them by the company shareholders. In contrast, non-salaried directors appointed by shareholders who receive compensation directly from the shareholders and work to further their interests through participation in company governance and the supervision of executive behavior. Such directors are less susceptible to the influence of the listed company's other executives and thus act more independently. In short, when directors appointed by shareholders receive compensation from the companies, they are more susceptible to the constraints of executive power when participating in company governance and making decisions. As they are also more likely to share the interests and priorities of the company executives, they may sacrifice shareholders' interests to gain more private income, which increases the company's pay gap. In contrast, when directors appointed by shareholders receive compensation from the shareholders, they do not have a direct economic connection with executives and are more likely to share and pursue shareholders' interests by strengthening their supervision of executive behavior, and ultimately reducing the company's pay gap. This suggests the following hypotheses:

Hypothesis 2. The ratio of salaried directors appointed by shareholders to the total number of directors is positively related to the company pay gap.

Hypothesis 3. The ratio of non-salaried directors appointed by shareholders to the total number of directors is negatively related to the company pay gap.

4. Research design

4.1. Sample

The 2005 revision of the "Annual Reporting Standards" required listed companies for the first time to disclose executive compensation on an individual basis. To ensure the integrity of the sample and to effectively investigate the relationship between shareholder-appointed directors and the pay gap, we examine listed companies in the 2005–2011 period, using all types of listed companies in our initial study sample except financial and insurance companies. After excluding incomplete observations, our sample comprises 9186 observations. Ownership data of listed companies was hand-collected from company annual reports and compensation and financial data were obtained from the China Stock Market and Accounting Research (CSMAR) database. As the sample is composed of different companies in different years, giving mixed (pooled) data, the annual observations of a given company do not meet the requirement of independence, which could lead us to overvalue the statistical significance of the regression results. To correct this statistical problem, we use a "clustering" method to adjust the standard error of the estimated coefficient for each company (Petersen, 2009).

4.2. Variables

4.2.1. Company pay gap

In line with existing research, we use the relative pay gap between executives and employees, and the relative compensation among executives to measure the company pay gap (Bu and Peng, 2010; Banker et al., 2011; Kato and Long, 2011).

We use the following equation to calculate the relative pay gap between executives and employees.

$$\mathrm{LEGap} = \mathrm{Ln}\left[\mathrm{MaxMPay} \Big/ \frac{\mathrm{CashPay} + \mathrm{SalPayCh} - \mathrm{TotMPay}}{\mathrm{EmpNum} - \mathrm{TotMNum}}\right] \tag{1}$$

We use the following equation to calculate the relative pay gap between the highest paid top executive and the other top executives.

$$\mathrm{LMGap} = \mathrm{Ln}\left[\mathrm{MaxMPay} \Big/ \frac{\mathrm{TotMPay} - \mathrm{MaxMPay}}{\mathrm{TotMNum} - 1}\right] \tag{2}$$

In the equations above, LEGap represents the natural logarithm of the relative pay gap between executives and employees, LMGay represents the natural logarithm of the relative pay gap between the highest paid top executive and the other top executives, and MaxMPay represents a company's highest executive compensation. CashPay represents the cash paid by the company to its employees, SalPayCh represents the change in the employee compensation paid by the company, TotMpay represents the total executive compensation awarded by the company, EmpNum represents the total number of employees and TotMNum represents the total number of executives.

4.2.2. Directors appointed by shareholders

Our measure of directors appointed by block shareholders is represented by the ratio of the number of directors appointed by block shareholders to the total number of directors on the board (Yeh and Woidtke, 2005; Chen et al., 2013). In Chinese listed companies, directors appointed by shareholders may receive compensation directly from the company for which they work, or from a source external to the company. Therefore, we define the following three variables: (1) directors appointed by shareholders (TPR), which is represented by the ratio of the number of directors appointed by shareholders to the total number of directors on the board; (2) salaried directors appointed by shareholders (PR), which is represented by the ratio of the number of shareholder-appointed directors who receive compensation directly from the listed company for which they work to the total number of directors on the board; and (3) non-salaried directors appointed by shareholders (NPR), which is represented by the ratio of the number of shareholder-appointed directors who do not receive compensation directly from their companies to the total number of directors on the board.

4.2.3. Control variables

Following recommendations made in the literature, we include the following control variables (Fang, 2009; Xin and Tan, 2009; Chen et al., 2011a): (1) Chairman and CEO duality (CEOD), which is equal to 1 if the chairman also holds the position of CEO, otherwise 0; (2) the size of the board of directors (Bsize), which is equal to the natural logarithm of the number of directors on the board; (3) independent directors (IndepR), which is equal to the ratio of the number of independent directors to the total number of directors on the board; (4) compensation committee (Commit), a dummy variable equal to 1 if the company has a compensation committee in the year under study, otherwise 0; (5) company performance (ROA), which is equal to the ratio of the company's net profit to its year-end total assets; (6) company size (Size), which is equal to the natural logarithm of the company's total assets in that year; (7) the company's leverage (Lev), which is equal to the ratio of the company's year-end long-term liabilities to its year-end total assets; (8) company risk (Risk), which is equal to the standard deviation of the monthly returns of the company's stock in that year; (9) company growth potential (Q), which is equal to the ratio of the sum of the company's tradable stock-market value, non-tradable stock-market value and liabilities to its last-year-end total assets; (10) cross-listing (Exch), which is equal to 1 if that year the company was also listed on other overseas exchanges, otherwise 0; and (11) special treatment (ST), which is equal to 1 if that year the company was under ST or *ST, otherwise 0.

4.3. Research model

First, we use the following regression model to examine the relationship between the presence of shareholder-appointed directors and the pay gap.

$$\begin{aligned}\text{Gap} = {} & \alpha + \beta_1 \text{TPR} + \beta_2 \text{CEOD} + \beta_3 \text{Bsize} + \beta_4 \text{IndepR} + \beta_5 \text{Commit} + \beta_6 \text{ROA} + \beta_7 \text{Size} + \beta_8 \text{Lev} \\ & + \beta_9 \text{Risk} + \beta_{10} Q + \beta_{11} \text{Exch} + \beta_{12} \text{ST} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon \end{aligned} \quad (3)$$

Table 1
Variable definitions.

Variables	Definitions
Pay-gap variables	
EGap	Ratio of the highest executive compensation to average employee (excluding executives') compensation
LEGap	Natural logarithm of EGap.
MGap	Ratio of the highest executive compensation to the average compensation of other executives
LMGap	Natural logarithm of MGap
Shareholder-appointed director variables	
TPR	Ratio of the number of directors appointed by block shareholders to the total number of directors on the board.
PR	Ratio of the number of directors appointed by block shareholders who receive salaries from the listed company to the total number of directors on the board.
NPR	Ratio of the number of directors appointed by block shareholders who do not receive salaries from the listed company to the total number of directors on the board
Board of director variables	
CEOD	Equal to 1 if the chairman also holds the position of CEO, otherwise 0
Bsize	Natural logarithm of the number of directors on the board
IndepR	Ratio of the number of independent directors to the total number of directors on the board
Commit	Equal to 1 if that year the company has a compensation committee, otherwise 0
Company variables	
ROA	Ratio of the company's net profit to its year-end total assets
Size	Natural logarithm of the company's year-end total assets
Lev	Ratio of the company's year-end long-term liabilities to its year-end total assets
Risk	Standard deviation of the monthly returns on the company's stock in that year
Q	Ratio of the sum of the company's tradable stock-market value, non-tradable stock-book value and liabilities to its last-year-end total assets
Exch	Equal to 1 if that year the company was also listed on other overseas exchanges, otherwise 0
ST	Equal to 1 if that year the company was under ST or *ST, otherwise 0

The following regression model is used to further investigate the different effects on the pay gap of salaried and non-salaried directors appointed by block shareholders.

$$\begin{aligned}\text{Gap} = {} & \alpha + \beta_1 \text{PR} + \beta_2 \text{NPR} + \beta_3 \text{CEOD} + \beta_4 \text{Bsize} + \beta_5 \text{IndepR} + \beta_6 \text{Commit} + \beta_7 \text{ROA} \\ & + \beta_8 \text{Size} + \beta_9 \text{Lev} + \beta_{10} \text{Risk} + \beta_{11} Q + \beta_{12} \text{Exch} + \beta_{13} \text{ST} + \text{Year fixed effect} \\ & + \text{Industry fixed effect} + \varepsilon \end{aligned} \tag{4}$$

The definitions of the variables used in the model are listed in Table 1. "Gap" signifies either LEGap or LMGap, as appropriate.

5. Empirical results and analysis

5.1. Descriptive statistics

To mitigate the effect of extreme values on our empirical analysis, we winsorize the top and bottom 1% of values for all continuous variables. Table 2 presents the descriptive statistics. In Panel A, we provide descriptive statistics for sub-groups of firms with and without directors appointed by shareholders. In firms with directors appointed by block shareholders, the mean (median) of the pay gap between executives and employees is 2.003 (1.978). In firms without directors appointed by block shareholders, the mean (median) of the pay gap between executives and employees is 1.916 (1.875). The differences between the mean and median for the two groups are significant at the 1% level ($t = 3.575$, $z = 3.912$). There are also significant differences in the mean and median of executives' pay gap between firms with and without directors appointed by shareholders. In Panel B, we divide firms with shareholder-appointed directors into firms with company-salaried and non-company-salaried directors to analyze differences in the company pay gap. In firms with salaried shareholder-appointed directors, the mean (median) of the pay gap between executives and employees is 2.085 (2.065) and the mean (median) of the pay gap between executives is 0.998 (0.956). In firms with non-salaried shareholder-appointed directors, the mean (median) of the pay gap between executives and employees is 1.810 (1.761) and the mean (median) of the pay gap between executives is 0.872 (0.805). Furthermore, the pay gap in firms with salaried directors appointed by shareholders is significantly larger than that in firms with non-salaried directors ($t = 15.731$, $z = 15.430$; $t = 15.768$, $z = 16.299$). This is probably due to the tendency for salaried directors appointed by block shareholders to increase the pay gap and for non-salaried directors appointed by block shareholders to decrease the pay gap.

In Panel C, we report the descriptive statistics for this paper's main variables. The average pay gap between executives and employees is 9.385, with the highest at 53.735. The average pay gap between executives is 2.706 and the highest is 8.290. The mean of the ratio of directors appointed by shareholders is 0.296. As the mean of the ratio of salaried shareholder-appointed directors is 0.103 and the mean of the ratio of non-salaried shareholder-appointed directors is 0.192, the ratio of non-salaried directors appointed by shareholders is nearly twice that of salaried directors. These findings indicate that the shareholders of the listed companies under study appoint more non-salaried than salaried directors. Regarding board of director variables, it is uncommon for CEOs to also be chairmen of the board, and there is little variation in the size of the boards of directors. Generally, independent directors comprise nearly one third of the board of directors and most of the companies have a compensation committee in the year under study. Of the sample companies, 3.2% are cross-listed and 9.3% are classified as ST in the year under study.

5.2. Correlation analysis

In Table 3, we provide the results of the correlation analysis of the main variables. The correlation coefficients of TPR and LEGap or LMGap are −0.046 and −0.043, respectively, and are significant at the 5% level. The correlation coefficients of PR and LEGap or LMGap are 0.140 and 0.141, respectively, and are significant at the 5% level. The correlation coefficients of NPR and LEGap or LMGap are −0.158 and −0.155, respectively, and are negatively significant at the 5% level. The results show that there is a negative correlation between the ratio of directors appointed by shareholders and the pay gap. More specifically, the ratio of

Table 2
Descriptive statistics.

Variables	Firms with directors appointed by block shareholders $N = 8053$			Firms without directors appointed by block shareholders $N = 1133$			t-Statistic	z-Statistic
	Mean	Median	SD	Mean	Median	SD		
Panel A: Descriptive statistics for pay gap in firms with and without directors appointed by shareholders								
LEGap	2.003	1.978	0.777	1.916	1.875	0.774	3.575***	3.912***
LMGap	0.942	0.890	0.357	0.921	0.860	0.361	1.826*	2.408**
Variables	Firms with salaried directors appointed by block shareholders $N = 3078$			Firms with non-salaried directors appointed by block shareholders $N = 4975$			t-Statistic	z-Statistic
	Mean	Median	SD	Mean	Median	SD		
Panel B: Descriptive statistics for pay gap in firms with salaried and non-salaried directors appointed by shareholders								
LEGap	2.085	2.065	0.785	1.810	1.761	0.748	15.731***	15.430***
LMGap	0.998	0.956	0.370	0.872	0.805	0.347	15.768***	16.299***
Variables	N	Mean	SD	Min	Q1	Median	Q3	Max
Panel C: Descriptive statistics for the main variables								
Pay gap variables								
EGap	9186	9.385	8.724	1.268	4.036	6.600	11.602	53.735
LEGap	9186	1.926	0.775	0.237	1.395	1.887	2.451	3.984
MGap	9186	2.706	1.183	1.364	1.937	2.371	3.089	8.290
LMGap	9186	0.923	0.361	0.310	0.661	0.864	1.128	2.115
Shareholder-appointed director variables								
TPR	9186	0.296	0.184	0.000	0.143	0.300	0.444	0.667
PR	9186	0.103	0.138	0.000	0.000	0.000	0.167	0.556
NPR	9186	0.192	0.176	0.000	0.000	0.167	0.333	0.600
Board of director variables								
CEOD	9186	0.162	0.368	0.000	0.000	0.000	0.000	1.000
Bsize	9186	2.204	0.202	1.609	2.197	2.197	2.303	2.708
IndepR	9186	0.361	0.049	0.250	0.333	0.333	0.375	0.556
Commit	9186	0.784	0.411	0.000	1.000	1.000	1.000	1.000
Company variables								
ROA	9186	0.039	0.072	−0.265	0.011	0.038	0.072	0.233
Size	9186	21.604	1.182	19.140	20.783	21.457	22.251	25.303
Lev	9186	0.074	0.104	0.000	0.000	0.026	0.110	0.471
Risk	9186	0.143	0.058	0.057	0.101	0.131	0.174	0.353
Q	9186	1.668	1.472	−2.795	0.883	1.345	2.096	9.169
Exch	9186	0.032	0.175	0.000	0.000	0.000	0.000	1.000
ST	9186	0.093	0.290	0.000	0.000	0.000	0.000	1.000

Table 3
Correlation analysis.

	LEGap	LMGap	TPR	PR	NPR	CEOD	Bsize	IndepR	Commit	ROA	Size	Lev	Risk	*Q*	Exch
LMGap	0.505*														
TPR	−0.046*	−0.043*													
PR	0.140*	0.141*	0.433*												
NPR	−0.158*	−0.155*	0.699*	−0.339*											
CEOD	0.059*	0.087*	−0.174*	0.006	−0.187*										
Bsize	0.051*	−0.017	0.186*	0.015	0.184*	−0.141*									
IndepR	0.029*	0.069*	−0.186*	−0.022*	−0.175*	0.079*	−0.327*								
Commit	0.089*	0.088*	−0.054*	0.026*	−0.076*	0.040*	−0.039*	0.096*							
ROA	0.217*	0.070*	0.029*	0.058*	−0.015	0.013	0.053*	−0.013	0.059*						
Size	0.182*	−0.048*	0.152*	0.059*	0.111*	−0.133*	0.265*	0.052*	0.119*	0.184*					
Lev	0.003	−0.023*	0.107*	0.0429*	0.079*	−0.116*	0.136*	0.011	0.033*	−0.074*	0.423*				
Risk	−0.062*	−0.006	0.013	−0.009	0.021*	−0.035*	−0.022*	−0.009	−0.017	−0.117*	−0.110*	−0.014			
Q	−0.044*	−0.064*	0.079*	0.018	0.068*	−0.087*	0.072*	−0.016	−0.035*	−0.197*	0.248*	0.276*	0.086*		
Exch	0.067*	0.003	0.038*	0.067*	−0.016	−0.042*	0.121*	0.060*	0.036*	0.020	0.332*	0.124*	−0.048*	0.053*	
ST	−0.109*	0.015	−0.008	−0.039*	0.024*	0.023*	−0.084*	0.005	0.009	−0.247*	−0.215*	−0.022*	0.118*	0.077*	−0.026*

* Significant at the 5% level (two-tailed test).

salaried directors appointed by shareholders is positively correlated with the pay gap, while the ratio of non-salaried directors appointed by shareholders is negatively correlated with the pay gap. This indicates that due to differences in their means of receiving compensation, directors appointed by shareholders have different effects on the pay gap. The pay gap increases with the increased presence of shareholder-appointed directors who receive compensation from a listed company, and decreases with the increased presence of shareholder-appointed directors who do not receive compensation from the company. Company risk (Risk), company growth potential (Q) and special treatment (ST) are negatively correlated with LEGap and are significant at the 5% level, whereas the other variables are positively correlated with LEGap. The size of the board of directors (Bsize) and the company's size (Size), leverage (Lev), risk (Risk) and growth potential (Q) are negatively correlated with LMGap, whereas the other variables are positively correlated with LMGap.

5.3. Regression analysis

Table 4 shows the regression results for the effects on the pay gap of directors appointed by block shareholders, salaried directors appointed by block shareholders and non-salaried directors appointed by block shareholders. We first examine the effects on the pay gap of the ratio of directors appointed by block shareholders and provide the corresponding regression results in columns (1) and (2) of Table 4. When the dependent variable is LEGap, TPR's regression coefficient is -0.197 and is significant at the 5% level ($t = -2.53$). This shows that when the ratio of directors appointed by block shareholders increases by one standard deviation, the pay gap between executives and employees will significantly decrease, by 3.63%. When the dependent variable is LMGap, TPR's regression coefficient is -0.006, so the pay gap between executives and employees will decrease by 1.10% with a one standard deviation increase in the ratio of directors appointed by shareholders. However, this coefficient is not significant ($t = -0.15$). Overall, these regression results show that the higher the ratio of directors appointed by block shareholders, the smaller the pay gap. This means that directors appointed by shareholders are to some extent able to represent shareholders' interests by effectively supervising executives, reducing their opportunistic behavior in pursuit of excessive pay, and thereby decreasing the company's pay gap. The regression results described above thus support our first hypothesis.

The directors appointed by block shareholders can be further divided into salaried directors appointed by block shareholders and non-salaried directors appointed by block shareholders, according to whether they receive compensation from the listed companies for which they work. We compare the effects on the pay gap of salaried and non-salaried directors appointed by block shareholders and report the corresponding regression results in columns (3) and (4) of Table 4. When the dependent variable is LEGap, the regression coefficient of the variable PR is 0.403, and that of the variable NPR is -0.532, both significant ($t = 4.01$; $t = -6.10$) at the 1% level. These results show that when the ratio of salaried directors appointed by block shareholders increases by one standard deviation, the pay gap between executives and employees increases by 5.56%. When the ratio of non-salaried directors appointed by shareholders increases by one standard deviation, the pay gap between executives and employees decreases by 9.36%. When the dependent variable is LMGap, PR's regression coefficient is 0.282 and NPR's regression coefficient is -0.165, and both are significant at the 1% level ($t = 5.51$; $t = -4.07$), which is consistent with the results for LEGap given in column (3). The results show that the higher the ratio of salaried directors appointed by block shareholders, the larger the pay gap, and the higher the ratio of non-salaried directors appointed by block shareholders, the smaller the pay gap. This suggests that only non-salaried directors appointed by block shareholders are able to provide effective supervision and thereby a better governance effect, namely decreasing the company pay gap. When the directors appointed to a listed company by its block shareholders receive compensation from the listed company itself, they are more likely to rely on the company's executives than to act independently on behalf of shareholders. As a result, they increase the company's pay gap further. In contrast, when the directors appointed by shareholders do not receive compensation from the listed company, they are more independent and are able to represent shareholders' interests by supervising executives and reducing their opportunistic efforts to obtain excessive pay. As a result, non-salaried directors reduce both agency costs and the company pay gap. The regression results provide supportive empirical evidence for our second and third hypotheses.

To eliminate the potential adverse effects of endogeneity, we also use the instrumental-variable regression method. In line with recent studies (Hoechle et al., 2012; Wintoki et al., 2012; Jayaraman and Milbourn, 2012),

Table 4
Regression results for the effects on pay gap of directors appointed by block shareholders.

	(1) Dependent variable: LEGap	(2) Dependent variable: LMGap	(3) Dependent variable: LEGap	(4) Dependent variable: LMGap
TPR	−0.197**	−0.006		
	(−2.53)	(−0.15)		
PR			0.403***	0.282***
			(4.01)	(5.51)
NPR			−0.532***	−0.165***
			(−6.10)	(−4.07)
CEOD	0.114***	0.064***	0.089**	0.052***
	(3.14)	(3.45)	(2.47)	(2.82)
Bsize	0.131	0.079**	0.161**	0.093**
	(1.58)	(2.10)	(1.98)	(2.51)
IndepR	0.061	0.470***	−0.018	0.432***
	(0.21)	(3.23)	(−0.06)	(2.97)
Commit	0.067**	0.054***	0.064**	0.052***
	(2.10)	(3.62)	(2.03)	(3.59)
ROA	1.763***	0.363***	1.704***	0.334***
	(10.12)	(4.36)	(9.88)	(4.07)
Size	0.112***	−0.024***	0.117***	−0.022***
	(6.15)	(−2.92)	(6.60)	(−2.67)
Lev	0.221	0.128*	0.184	0.110
	(1.41)	(1.72)	(1.19)	(1.51)
Risk	−0.337*	−0.071	−0.267	−0.038
	(−1.68)	(−0.74)	(−1.34)	(−0.40)
Q	−0.017**	−0.007	−0.018**	−0.007*
	(−2.07)	(−1.57)	(−2.30)	(−1.79)
Exch	0.105	0.047	0.052	0.021
	(1.00)	(0.94)	(0.50)	(0.44)
ST	−0.089**	0.023	−0.070	0.033
	(−2.01)	(1.08)	(−1.59)	(1.57)
Intercept	−0.905**	1.009***	−1.025**	0.952***
	(−2.17)	(5.31)	(−2.53)	(5.04)
Industry	Control	Control	Control	Control
Year	Control	Control	Control	Control
N	9186	9186	9186	9186
Adj. R−sq	0.124	0.040	0.145	0.063
*N*_clust	1985	1985	1985	1985
F	15.176	6.426	18.289	9.251

Note: All coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *t*-Statistics are provided in brackets.
* Significance at the 10% level (two-tailed test).
** Significance at the 5% levels (two-tailed test).
*** Significance at the 1% levels (two-tailed test).

our instrumental variables for the two-stage least-squares regression are the industry's mean and the previous year's value of the ratio of directors appointed by shareholders (ratio of salaried directors appointed by block shareholders and ratio of non-salaried directors appointed by block shareholders). Following the recommendations by Larcker and Rusticus (2010), we also conduct a validation test on the correlation conditions and exogenous conditions of the two instrumental variables.

In Table 5, we report the results of the instrumental-variable correlation test, the exogenous test and the instrumental-variable regression. When the dependent variable is LEGap, the instrumental-variable correlation test gives *F*-values for PR and NPR that are both larger than 10 ($F = 963.62 > 10$; $F = 1531.82 > 10$), which means that our selected instrumental variables fulfill the correlation conditions. The results of the instrumental-variable exogenous test do not have statistical significance ($J = 3.170$, $P = 0.2049$), so we cannot reject the null hypothesis. That is, our results pass the instrumental-variable exogenous test. As they fulfill both the correlation conditions and the exogenous conditions, our instrumental variables can be considered

Table 5
Regression results using instrumental variables.

	Dependent variable: LEGap	Dependent variable: LMGap
PR	0.572***	0.385***
	(3.88)	(5.08)
NPR	−0.667***	−0.174***
	(−5.29)	(−2.95)
CEOD	0.079*	0.061***
	(1.83)	(2.75)
Bsize	0.126	0.085**
	(1.40)	(2.08)
IndepR	−0.184	0.501***
	(−0.59)	(3.17)
Commit	0.067*	0.043**
	(1.82)	(2.54)
ROA	1.715***	0.405***
	(9.14)	(4.56)
Size	0.128***	−0.022**
	(6.82)	(−2.41)
Lev	0.098	0.085
	(0.60)	(1.09)
Risk	−0.178	0.035
	(−0.83)	(0.34)
Q	−0.020**	−0.007
	(−2.52)	(−1.60)
Exch	0.022	0.022
	(0.20)	(0.42)
ST	−0.062	0.039*
	(−1.34)	(1.73)
Intercept	−0.848*	1.039***
	(−1.91)	(4.88)
Industry	Control	Control
Year	Control	Control
N	7266	7266
Adj. R-sq	0.143	0.069
*N*_clust	1597	1597
F	14.784	7.184
Weak instrumental-variable test	PR: $F = 963.62$	PR: $F = 963.62$
	NPR: $F = 1531.82$	NPR: $F = 1531.82$
Overidentifying-restrictions *J*-test and *P*-value	$J = 3.170$, $P = 0.2049$	$J = 5.236$, $P = 0.0729$

Note: All of the coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *z*-Statistics are provided in brackets.
* Significance at the level of 10% (two-tailed test).
** Significance at the level of 5% (two-tailed test).
*** Significance at the level of 1% (two-tailed test).

valid. Using the instrumental variables, the regression results for PR and NPR are 0.572 and −0.667, which are both significant at the 1% level ($z = 3.88$, $z = -5.29$). When the dependent variable is LMGap, the results are almost the same. Therefore, after addressing the endogeneity problem, the results of the study still hold. In short, salaried directors appointed by block shareholders significantly increase their companies' pay gap, while non-salaried directors appointed by block shareholders significantly decrease their companies' pay gap.

5.4. Additional tests

5.4.1. The effects of industry competition

Table 6 shows the regression results for the effects of different levels of industry competition on the governance effects of directors appointed by block shareholders, with the total number of companies in the industry

Table 6
Regression results of the effects of product market competition.

	Dependent variable: LEGap		Dependent variable: LMGap	
	(1) High competition	(2) Low competition	(3) High competition	(4) Low competition
PR	0.414***	0.405***	0.199***	0.368***
	(2.85)	(3.05)	(2.69)	(5.65)
NPR	−0.664***	−0.432***	−0.255***	−0.088
	(−5.40)	(−3.68)	(−4.54)	(−1.59)
CEOD	0.050	0.115**	0.030	0.070***
	(1.04)	(2.23)	(1.32)	(2.62)
Bsize	−0.051	0.329***	0.078	0.109**
	(−0.41)	(3.17)	(1.46)	(2.21)
IndepR	−0.085	0.006	0.574**	0.329*
	(−0.18)	(0.02)	(2.34)	(1.94)
Commit	0.104**	0.025	0.062***	0.042**
	(2.31)	(0.60)	(2.97)	(2.17)
ROA	2.080***	1.349***	0.575***	0.110
	(8.52)	(6.01)	(4.96)	(1.03)
Size	0.102***	0.131***	−0.025**	−0.020*
	(3.91)	(5.62)	(−2.16)	(−1.78)
Lev	0.265	0.080	0.137	0.061
	(1.08)	(0.42)	(1.19)	(0.67)
Risk	−0.427	−0.026	−0.170	0.118
	(−1.52)	(−0.09)	(−1.28)	(0.88)
Q	−0.014	−0.021**	−0.005	−0.009*
	(−1.09)	(−2.22)	(−0.76)	(−1.78)
Exch	0.027	0.063	−0.027	0.060
	(0.18)	(0.48)	(−0.42)	(0.93)
ST	−0.070	−0.064	0.072**	−0.005
	(−1.11)	(−1.10)	(2.36)	(−0.18)
Intercept	−0.185	−1.747***	1.013***	0.875***
	(−0.32)	(−3.32)	(3.84)	(3.43)
Industry	Control	Control	Control	Control
Year	Control	Control	Control	Control
N	4240	4946	4240	4946
Adj. R-sq	0.133	0.162	0.065	0.065
*N*_clust	1045	1143	1045	1143
F	12.158	14.018	7.794	7.099

Note: All of the coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *t*-Statistics are provided in brackets.
* Significance at the level of 10% (two-tailed test).
** Significance at the level of 5% (two-tailed test).
*** Significance at the level of 1% (two-tailed test).

used as a proxy for industry competition. This measure is common in existing papers (e.g. Li, 2010). We divide the sample into a group of firms facing high competition and a group of firms facing low competition, according to the magnitude of each company's industry. When the dependent variable is LEGap, PR's regression coefficients in the high-competition group and the low-competition group are 0.414 and 0.405 respectively, and both are significantly positive at the 1% level ($t = 2.85$, $t = 3.05$). The differences in the regression coefficients for these two groups do not pass the significance test (p-value = 0.94), so different levels of industry competition can be considered to have no significant effects on the relationship between the governance of salaried shareholder-appointed directors and the pay gap. NPR's regression coefficients in the high-competition and low-competition group are −0.664 and −0.432, respectively, and are significant at the 1% level ($t = -5.40$, $t = -3.68$). It is clear that when an industry is highly competitive, the role of non-salaried shareholder-appointed directors in decreasing the pay gap is much larger, with this difference statistically significant (p-value = 0.09). When the dependent variable is LMgap, the results are consistent. In highly competitive industries, the governance effects of non-salaried shareholder-appointed directors on the pay gap are more

significant. The regression results indicate that the pay-gap phenomenon exhibited by China's listed companies is due to agency problems within the companies, rather than the result of incentivizing pay. This is at odds with our competitive hypothesis: that the increased pay gap is due to the use of incentives. It also shows that the presence of non-salaried directors appointed by block shareholders and external industry competition play complementary roles in the process by which effective governance decreases the pay gap.

5.4.2. The influence of state ownership

We also examine differences in the governance effects of directors appointed by block shareholders between state-owned enterprises and non-state-owned enterprises. In Table 7, we report the regression results for the effects of salaried and non-salaried directors appointed by block shareholders on the pay gap in state-owned enterprises and non-state-owned enterprises. As shown in the table, when the dependent variable is LEGap, PR's regression coefficients are 0.482 and 0.256, significant at the 1% level ($t = 3.26$) and the 5% level ($t = 2.00$)

Table 7
Regression results for the effects of state ownership on the governance of directors appointed by shareholders.

	Dependent variable: LEGap		Dependent variable: LMGap	
	(1) State-owned	(2) Non-state-owned	(3) State-owned	(4) Non-state-owned
PR	0.482***	0.256**	0.392***	0.150**
	(3.26)	(2.00)	(5.64)	(2.10)
NPR	−0.247**	−0.497***	−0.053	−0.097
	(−2.13)	(−3.69)	(−1.05)	(−1.35)
CEOD	0.077	0.034	0.017	0.044*
	(1.29)	(0.81)	(0.61)	(1.86)
Bsize	0.068	0.426***	0.070	0.184***
	(0.67)	(3.73)	(1.60)	(3.13)
IndepR	−0.325	0.947**	0.412**	0.690***
	(−0.97)	(2.19)	(2.58)	(2.79)
Commit	0.070*	0.066	0.065***	0.040*
	(1.73)	(1.51)	(3.69)	(1.70)
ROA	1.440***	1.620***	0.356***	0.116
	(6.05)	(7.25)	(3.37)	(0.95)
Size	0.110***	0.220***	−0.023**	0.013
	(5.03)	(8.10)	(−2.35)	(0.94)
Lev	0.099	0.649***	0.086	0.225*
	(0.53)	(2.75)	(0.99)	(1.73)
Risk	−0.217	−0.301	−0.011	−0.026
	(−0.82)	(−1.08)	(−0.09)	(−0.18)
Q	−0.013	−0.027**	−0.004	−0.010*
	(−1.28)	(−2.53)	(−0.79)	(−1.68)
Exch	0.149	0.259	0.039	0.209*
	(1.47)	(1.13)	(0.81)	(1.67)
ST	−0.076	−0.042	0.035	0.030
	(−1.31)	(−0.71)	(1.37)	(0.91)
Intercept	−0.787	−3.809***	0.939***	−0.003
	(−1.55)	(−6.28)	(4.28)	(−0.01)
Industry	Control	Control	Control	Control
Year	Control	Control	Control	Control
N	5301	3885	5301	3885
Adj. R-sq	0.127	0.206	0.058	0.044
*N*_clust	1011	1120	1011	1120
F	8.602	12.349	4.734	3.097

Note: All of the coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *t*-Statistics are provided in brackets.
* Significance at the level of 10% (two-tailed test).
** Significance at the level of 5% (two-tailed test).
*** Significance at the level of 1% (two-tailed test).

Table 8
Regression results for the effects on pay gap of directors appointed by controlling shareholders and non-controlling shareholders.

	Dependent variable: LEGap		Dependent variable: LMGap	
	(1)	(2)	(3)	(4)
PR	0.403***		0.282***	
	(4.01)		(5.51)	
NPR	−0.532***		−0.165***	
	(−6.10)		(−4.07)	
CPR		0.392***		0.233***
		(3.41)		(3.98)
NCPR		0.309		0.464***
		(1.62)		(4.78)
CNPR		−0.774***		−0.194***
		(−7.57)		(−4.06)
NCNPR		−0.113		−0.113*
		(−0.91)		(−1.90)
CEOD	0.089**	0.079**	0.052***	0.050***
	(2.47)	(2.22)	(2.82)	(2.74)
Bsize	0.161**	0.133	0.093**	0.084**
	(1.98)	(1.64)	(2.51)	(2.26)
IndepR	−0.018	−0.040	0.432***	0.429***
	(−0.06)	(−0.14)	(2.97)	(2.96)
Commit	0.064**	0.063**	0.052***	0.051***
	(2.03)	(2.00)	(3.59)	(3.53)
ROA	1.704***	1.721***	0.334***	0.341***
	(9.88)	(10.00)	(4.07)	(4.15)
Size	0.117***	0.127***	−0.022***	−0.020**
	(6.60)	(7.09)	(−2.67)	(−2.36)
Lev	0.184	0.188	0.110	0.112
	(1.19)	(1.22)	(1.51)	(1.53)
Risk	−0.267	−0.276	−0.038	−0.043
	(−1.34)	(−1.38)	(−0.40)	(−0.45)
Q	−0.018**	−0.019**	−0.007*	−0.007*
	(−2.30)	(−2.44)	(−1.79)	(−1.84)
Exch	0.052	0.052	0.021	0.016
	(0.50)	(0.51)	(0.44)	(0.33)
ST	−0.070	−0.064	0.033	0.032
	(−1.59)	(−1.47)	(1.57)	(1.55)
Intercept	−1.025**	−1.163***	0.952***	0.927***
	(−2.53)	(−2.87)	(5.04)	(4.88)
Industry	Control	Control	Control	Control
Year	Control	Control	Control	Control
N	9186	9186	9186	9186
Adj. R-sq	0.145	0.151	0.063	0.065
*N*_clust	1985	1985	1985	1985
F	18.289	17.698	9.251	9.051

Note: All of the coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *t*-Statistics are provided in brackets.
* Significance at the level of 10% (two-tailed test).
** Significance at the level of 5% (two-tailed test).
*** Significance at the level of 1% (two-tailed test).

for the group of state-owned enterprises and the group of non-state-owned enterprises, respectively. NPR's regression coefficients are −0.247 and −0.497, respectively, significant at the 5% level ($t = -2.13$) and the 1% level ($t = -3.69$). When the dependent variable is LMGap, PR's regression coefficients are 0.392 and 0.150, significant at the 1% level ($t = 5.64$) and the 5% level ($t = 2.10$) for the group of state-owned enterprises and the group of non-state-owned enterprises, respectively. NPR's regression coefficients are −0.053 and −0.097 respectively, but are insignificant ($t = -1.05$, $t = -1.35$). The regression results indicate that salaried

directors appointed by block shareholders increase the pay gap, while non-salaried directors appointed by shareholders decrease the pay gap, and that there is no difference in these relationships between state-owned enterprises and non-state-owned enterprises. In other words, the relationship between the pay gap and the presence of directors appointed by block shareholders is not affected by state ownership.

5.4.3. The effects of directors appointed by controlling shareholders and non-controlling shareholders

To assess the different motivations of directors appointed by controlling shareholders and non-controlling shareholders, we examine separately the effects on the pay gap of directors appointed by controlling shareholders and those appointed by non-controlling shareholders. We manually obtain the data for the two variables (directors appointed by controlling shareholders and directors appointed by non-controlling shareholders) by extracting details of the directors appointed by all types of shareholders from the CSMAR

Table 9
Regression results for the effects of directors appointed by shareholders on pay gap when the individual with the highest compensation has different administrative positions.

	Dependent variable: LEGap			Dependent variable: LMGap		
	Chairman of the board	General manager	Others	Chairman of the board	General manager	Others
PR	0.265**	0.438***	0.535**	0.170***	0.390***	0.305**
	(2.11)	(3.37)	(2.12)	(2.85)	(5.66)	(2.32)
NPR	−0.459***	−0.395***	−0.711***	−0.159***	−0.170***	−0.201*
	(−3.70)	(−3.62)	(−3.40)	(−2.70)	(−3.38)	(−1.77)
CEOD	0.054	0.150***	0.083	0.064***	0.041*	0.099**
	(1.30)	(3.59)	(1.01)	(2.94)	(1.88)	(2.17)
Bsize	0.233**	0.080	0.456**	0.094**	0.076*	0.084
	(2.15)	(0.85)	(2.27)	(2.00)	(1.77)	(0.80)
IndepR	0.437	−0.315	−0.073	0.365*	0.445***	−0.141
	(1.09)	(−0.96)	(−0.11)	(1.76)	(2.76)	(−0.41)
Commit	0.071*	0.066*	0.061	0.060***	0.048***	0.083*
	(1.75)	(1.68)	(0.71)	(3.09)	(2.65)	(1.92)
ROA	1.723***	1.771***	1.119***	0.394***	0.317***	−0.130
	(7.09)	(8.29)	(2.86)	(3.34)	(3.33)	(−0.62)
Size	0.170***	0.108***	0.016	−0.019*	−0.024**	−0.007
	(7.15)	(5.13)	(0.42)	(−1.72)	(−2.36)	(−0.33)
Lev	−0.007	0.284	0.437	0.111	0.140	−0.058
	(−0.03)	(1.50)	(1.25)	(1.01)	(1.52)	(−0.33)
Risk	−0.124	−0.288	0.424	−0.080	−0.155	0.486*
	(−0.47)	(−1.07)	(0.76)	(−0.62)	(−1.26)	(1.67)
Q	−0.029***	−0.011	−0.028	−0.009	−0.006	−0.008
	(−2.65)	(−1.14)	(−1.37)	(−1.62)	(−1.15)	(−0.86)
Exch	−0.099	0.050	0.364**	0.040	−0.024	0.104
	(−0.61)	(0.47)	(2.24)	(0.47)	(−0.49)	(1.20)
ST	−0.026	−0.053	−0.185*	0.058*	0.038	−0.006
	(−0.44)	(−0.99)	(−1.83)	(1.90)	(1.52)	(−0.11)
Intercept	−2.422***	−0.586	0.348	0.893***	1.087***	0.735
	(−4.47)	(−1.21)	(0.39)	(3.54)	(4.70)	(1.45)
Industry	Control	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control	Control
N	4833	5307	832	4833	5307	832
Adj. R-sq	0.150	0.151	0.132	0.055	0.080	0.072
N_clust	1439	1600	490	1439	1600	490
F	10.790	13.563	3.290	5.277	7.532	1.869

Note: All of the coefficient estimates are adjusted using heteroskedasticity and company clustering to obtain robust standard errors. Adjusted *t*-Statistics are provided in brackets.

* Significance at the level of 10% (two-tailed test).

** Significance at the level of 5% (two-tailed test).

*** Significance at the level of 1% (two-tailed test).

database, checking them one by one, and thus distinguishing the directors appointed by controlling shareholders from those appointed by non-controlling shareholders. To examine further effects of this variable, if any, on the pay gap, we divide the ratio of salaried directors appointed by shareholders (PR) into the ratio of salaried directors appointed by controlling shareholders (CPR) and the ratio of salaried directors appointed by non-controlling shareholders (NCPR), and divide the ratio of non-salaried directors appointed by shareholders (NPR) into the ratio of non-salaried directors appointed by controlling shareholders (CNPR) and the ratio of non-salaried directors appointed by non-controlling shareholders (NCNPR).

In Table 8, we report the corresponding regression results. When the dependent variable is LEGap, the regression coefficients of PR and NPR, as shown in column (1), are 0.403 and −0.532, respectively, both significant at the 1% level ($t = 4.01$, $t = -6.10$). The regression coefficient of CPR, as shown in column (2), is 0.392, significant at the 1% level ($t = 3.41$), whereas the regression coefficient of NCPR is 0.309, which is insignificant ($t = 1.62$). The regression coefficient of CNPR is −0.774, significant at the 1% level ($t = -7.57$), whereas the regression coefficient of NCNPR is −0.113, which is insignificant ($t = -0.91$). When the dependent variable is LMGap, the regression coefficients of PR and NPR, as shown in column (3), are 0.282 and −0.165, respectively, both significant at the 1% level ($t = 5.51$, $t = -4.07$). The regression coefficients of CPR and NCPR, as shown in column (4), are both significantly positive, whereas the regression coefficients of CNPR and NCNPR are both significantly negative. Taken together, these results indicate that the governance of directors appointed by controlling shareholders does not differ from that of directors appointed by non-controlling shareholders with regard to pay gaps resulting from agency problems.

5.4.4. The influence of administrative posts

To assess the potential influence of the administrative post of the company executives who receive the highest compensation, we first divide the company personnel with the highest compensation into chairmen of the board (including Vice Chairmen), general managers (including Vice Presidents) and other executive positions. Next, we use these subsamples to examine the governance effect of directors appointed by block shareholders on the pay gap. In Table 9, we report the corresponding regression results. The results for the three subsamples show that salaried directors appointed by shareholders significantly increase the pay gap, whereas non-salaried directors appointed by shareholders significantly decrease the pay gap. The results obtained from carrying out separate regressions on the three categories—chairmen of the board, general managers and other executive positions—indicates that the administrative post has no significant effect on the results reported in this paper.

6. Conclusion and discussion

Originally, the pay gap phenomenon could generally be explained by tournament theory. That is, an appropriate pay gap can increase employee motivation and productivity. However, in recent years, company pay gaps have continued to widen, which now seems to be due to the misuse of power by company executives to influence the formulation of compensation. Therefore, based on the executive-power theory, this paper examines the effects of companies' governance mechanisms on their pay gap. According to the executive-power theory, CEOs are particularly likely to use their power to influence the design of compensation packages in order to increase their own compensation beyond the optimal pay level, thereby producing an excessive pay gap. Such a pay gap has a series of negative economic consequences, such as the failure of salary–related incentive mechanisms and a decline in company performance. Therefore, it is necessary to examine how companies' governance mechanisms ease the agency problem during the formulation of salary structure and thereby reduce excessive pay gaps.

Using a sample of Chinese A-share listed companies during the 2005–2011 period, we first examine the effects on pay gap of the presence of directors appointed by shareholders. The results show that on average, directors appointed by shareholders have a negative effect on the pay gap. Next, we distinguish between shareholder-appointed directors according to whether they are salaried by the company or an external source. The results show that the presence of salaried directors appointed by shareholders significantly increases the pay gap, while the presence of non-salaried directors appointed by shareholders significantly decreases the pay gap. Therefore, it may be difficult for salaried directors appointed by the shareholders of listed companies to effectively supervise the company's executives, due to a lack of independence. In contrast, non-salaried

directors appointed by block shareholders are better able to represent shareholders' interests in carrying out effective supervision of executives. In this paper, we also use the instrumental-variable regression method to eliminate the potential adverse effect of endogeneity and conduct some further tests to reduce the potential effect of correlated factors on the results of the paper. Our conclusions cast light on the pay-gap phenomenon exhibited by China's listed companies and offer insights into the decision-making behavior of salaried and non-salaried directors appointed by block shareholders to supervise executives.

Acknowledgments

This paper is the result of research supported by the National Nature Science Foundation of China (71263034, 71002111), the Humanities and Social Science Project of the Ministry of Education of China (10XJC630003) and the Program of Higher-level Talents at Inner Mongolia University, China (Z20100103). We acknowledge the executive editor and the anonymous reviewer for their useful comments and suggestions.

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